Fig. 1

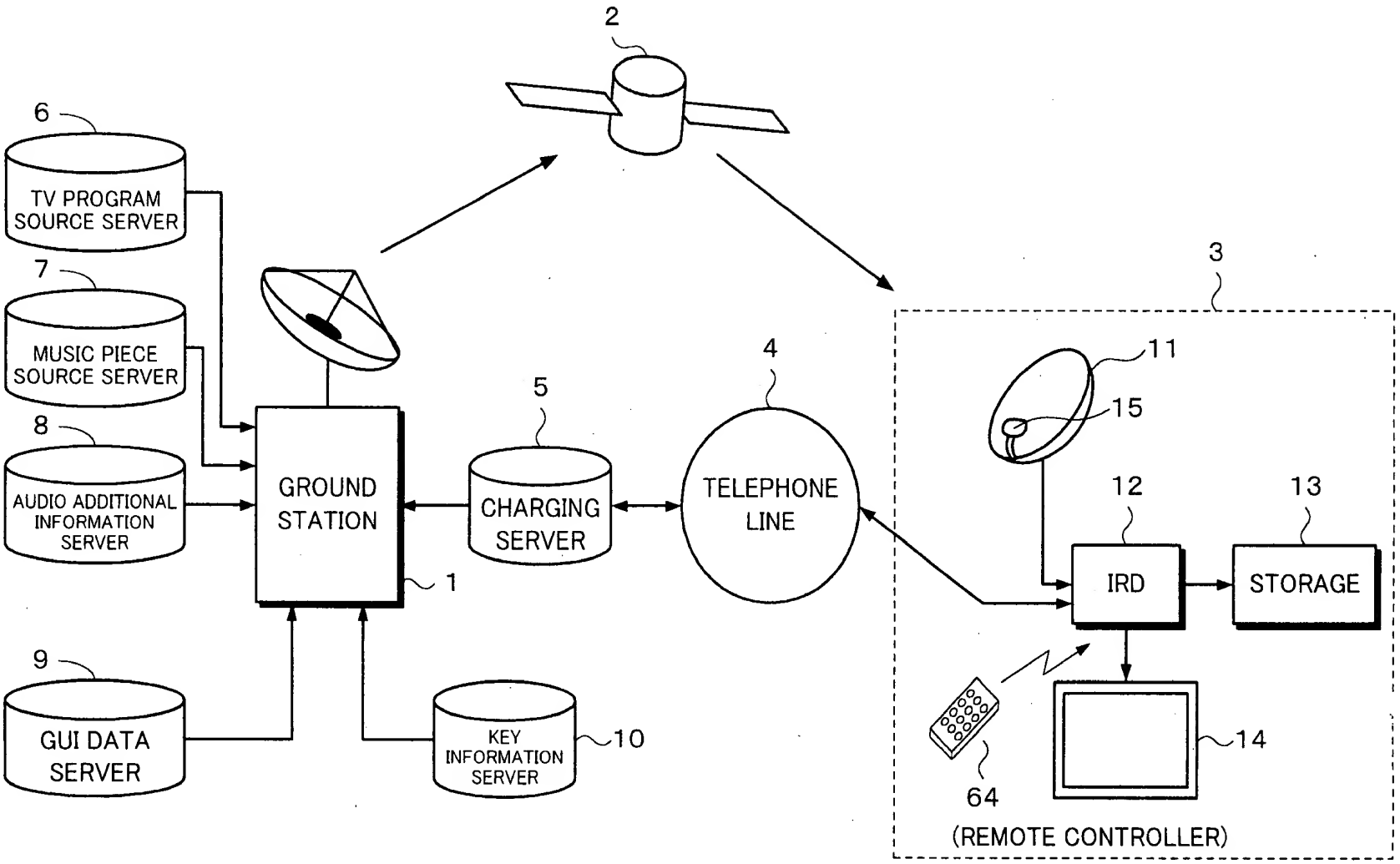

2
6
TV PROGRAM SOURCE SERVER
7
MUSIC PIECE SOURCE SERVER
8
AUDIO ADDITIONAL INFORMATION SERVER
9
GUI DATA SERVER
GROUND STATION
1
5
CHARGING SERVER
4
TELEPHONE LINE
KEY INFORMATION SERVER
10
3
11
15
12
IRD
13
STORAGE
14
64
(REMOTE CONTROLLER)

Fig. 2

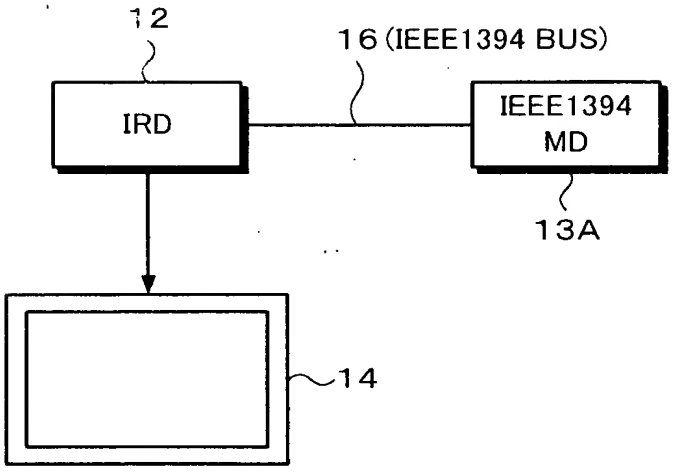


Fig. 3

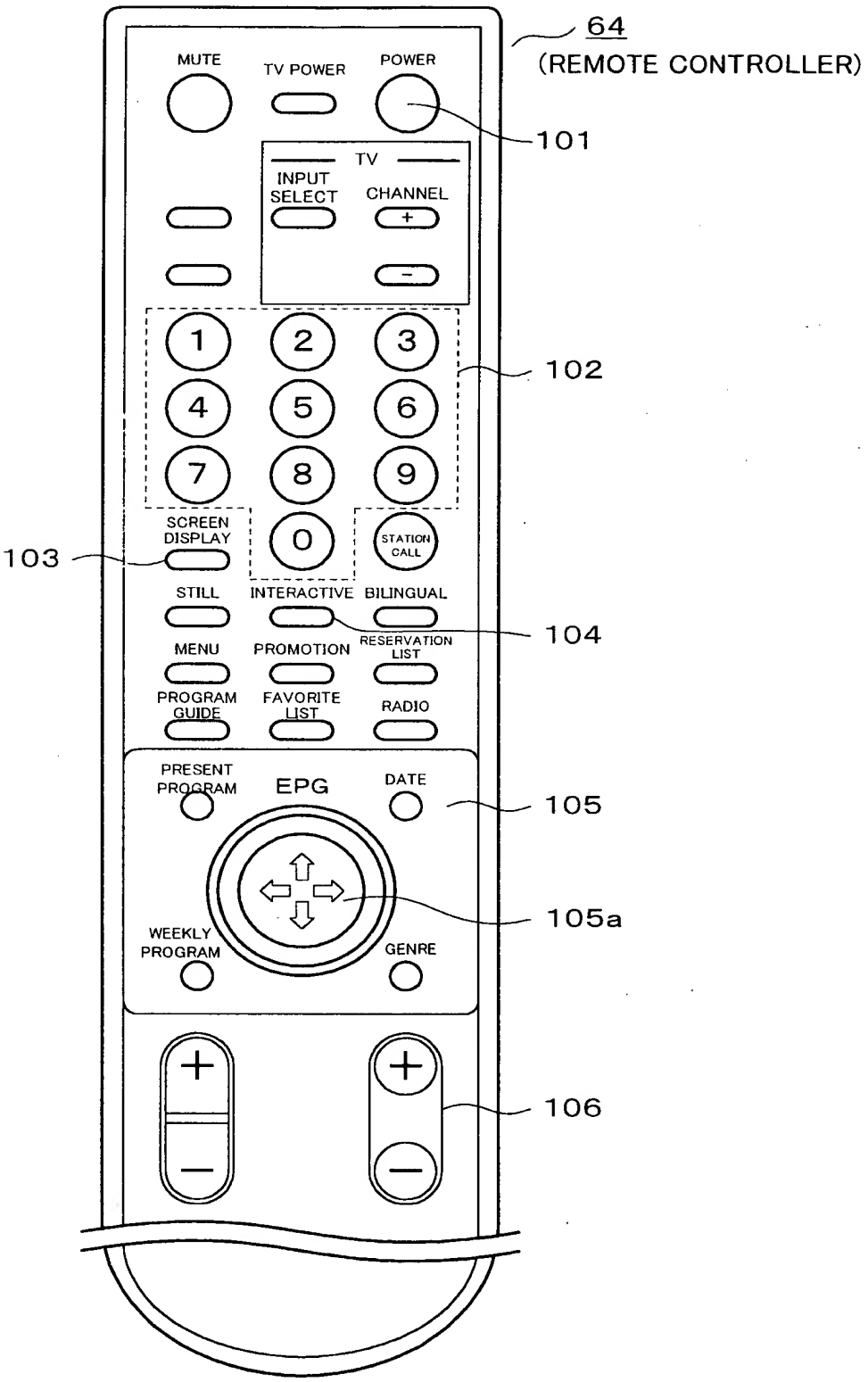
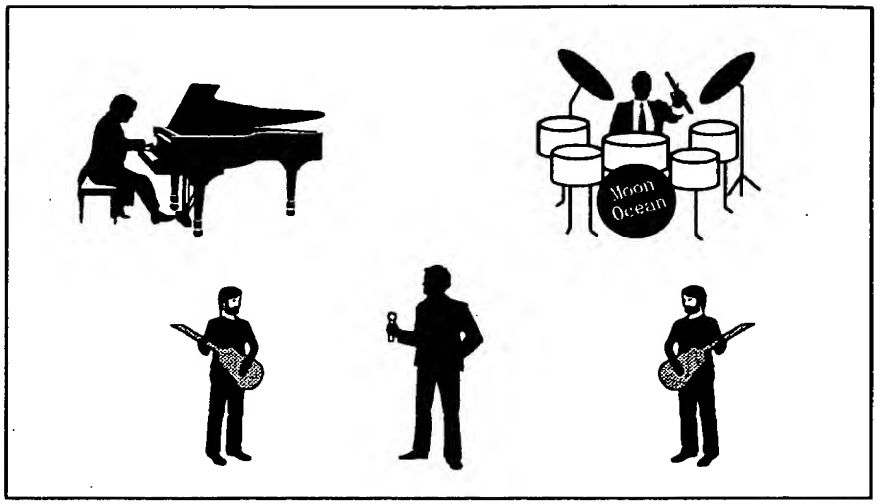

64
(REMOTE CONTROLLER)
MUTE
TV POWER
POWER
101
TV
INPUT SELECT
CHANNEL
+
-
1
2
3
4
5
6
7
8
9
102
SCREEN DISPLAY
0
STATION CALL
103
STILL
INTERACTIVE
BILINGUAL
104
RESERVATION LIST
MENU
PROMOTION
PROGRAM GUIDE
FAVORITE LIST
RADIO
PRESENT PROGRAM
EPG
DATE
105
105a
WEEKLY PROGRAM
GENRE
106

Fig. 4A



INTERACTIVE
CHANGE-OVER
KEY OPERATION

Fig. 4B

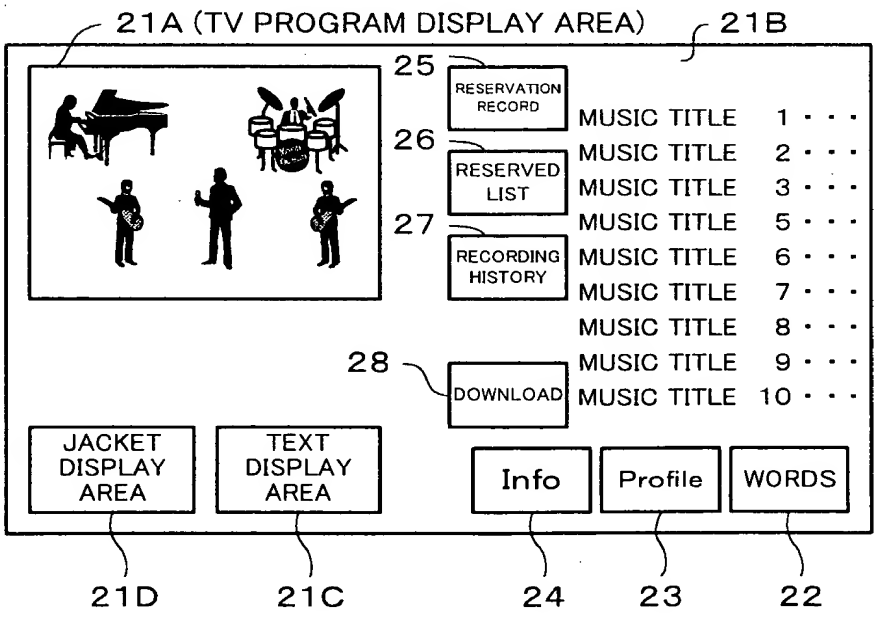


Fig. 5

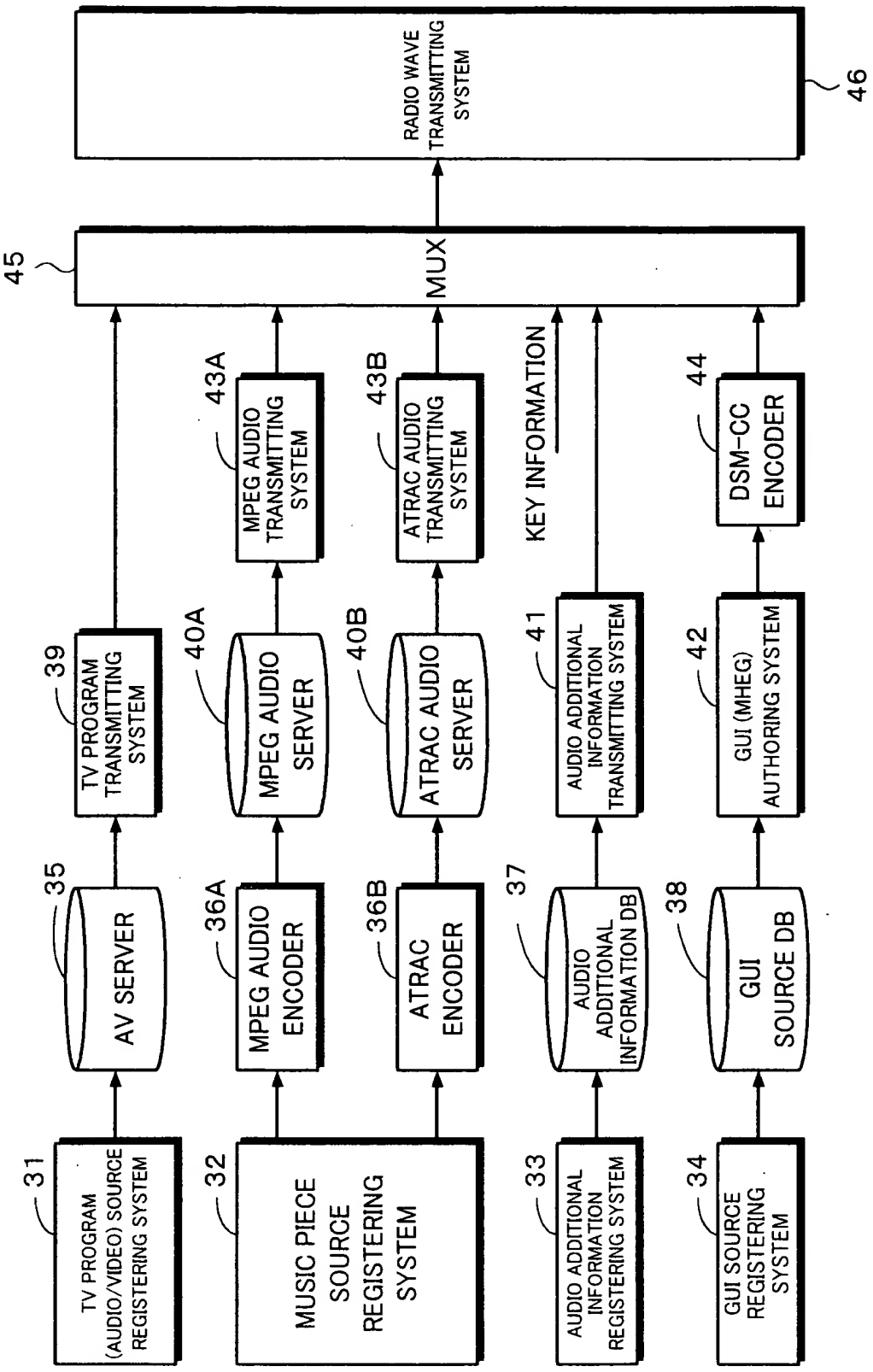

RADIO WAVE TRANSMITTING SYSTEM
46
MUX
45
KEY INFORMATION
TV PROGRAM TRANSMITTING SYSTEM
39
MPEG AUDIO TRANSMITTING SYSTEM
43A
ATRAC AUDIO TRANSMITTING SYSTEM
43B
DSM-CC ENCODER
44
AV SERVER
35
MPEG AUDIO SERVER
40A
ATRAC AUDIO SERVER
40B
AUDIO ADDITIONAL INFORMATION TRANSMITTING SYSTEM
41
GUI (MHEG) AUTHORING SYSTEM
42
MPEG AUDIO ENCODER
36A
ATRAC ENCODER
36B
AUDIO ADDITIONAL INFORMATION DB
37
GUI SOURCE DB
38
TV PROGRAM (AUDIO/VIDEO) SOURCE REGISTERING SYSTEM
31
MUSIC PIECE SOURCE REGISTERING SYSTEM
32
AUDIO ADDITIONAL INFORMATION REGISTERING SYSTEM
33
GUI SOURCE REGISTERING SYSTEM
34

Fig. 6

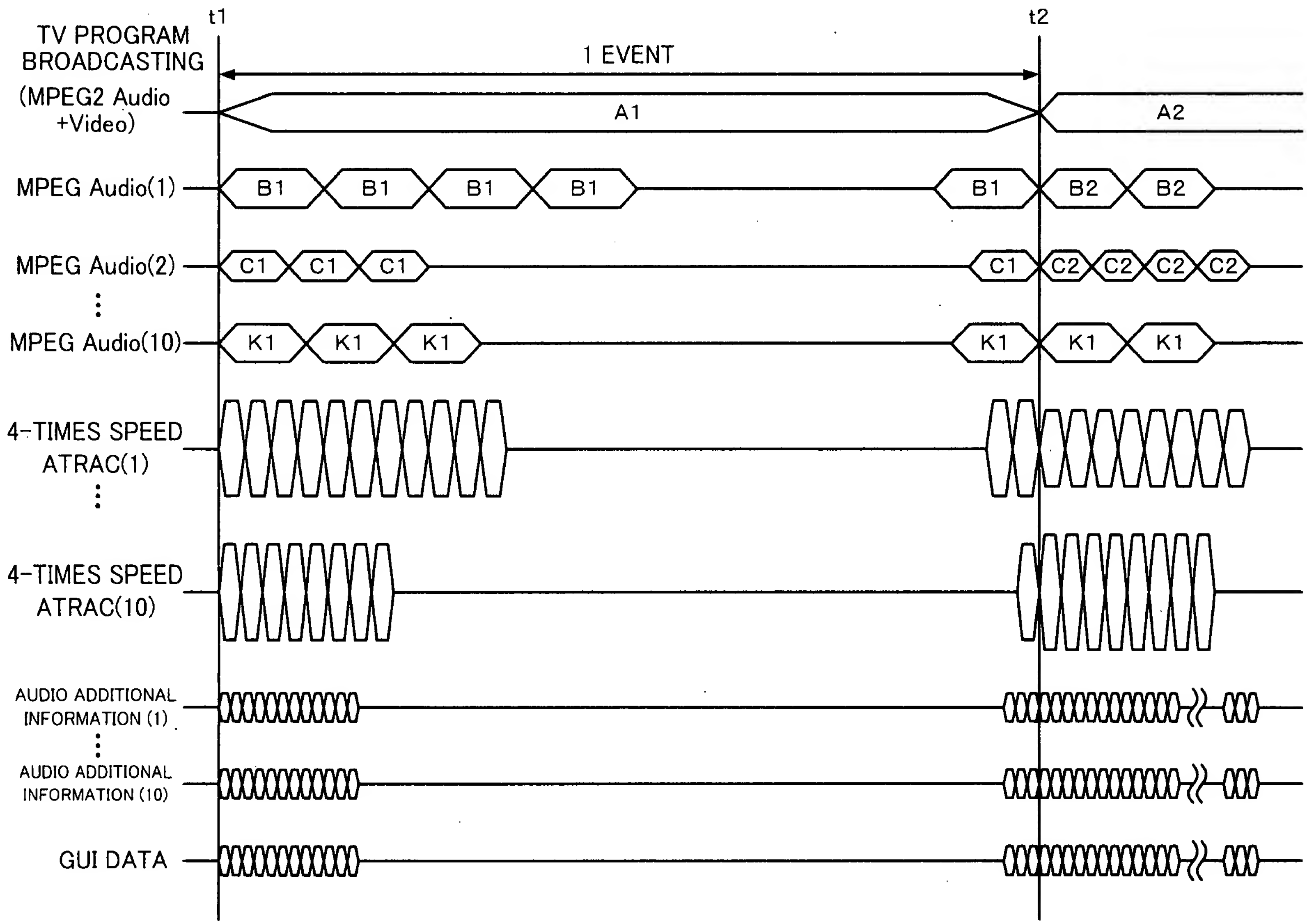


Fig. 7A

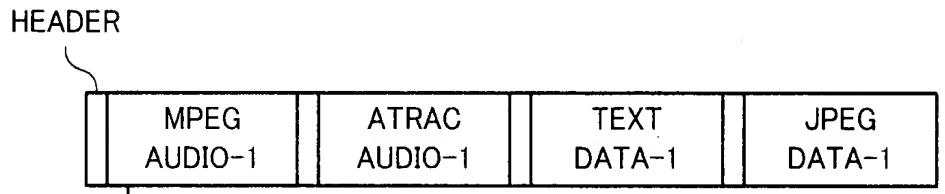


Fig. 7B

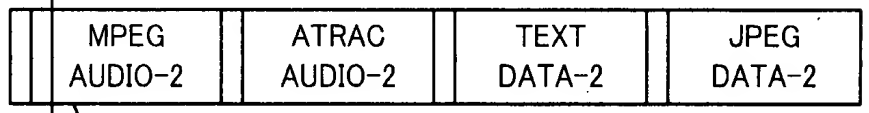


Fig. 7C

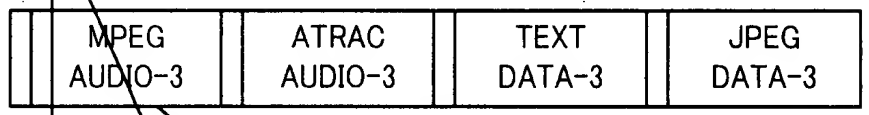


Fig. 7D

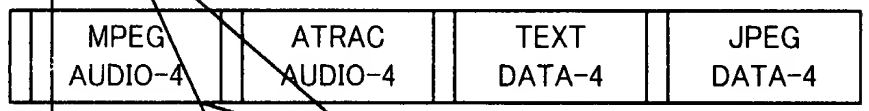


Fig. 7E

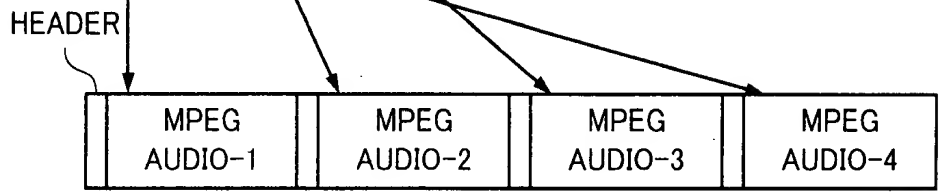


Fig. 7F

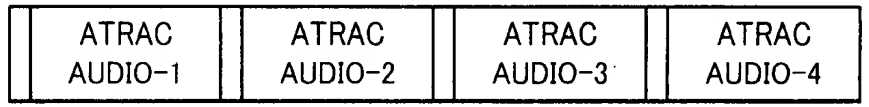


Fig. 7G

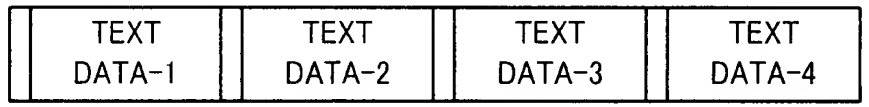


Fig. 7H

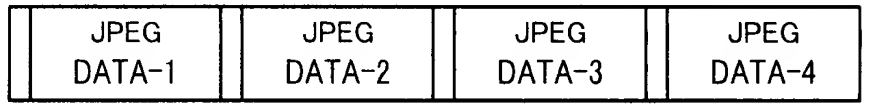


Fig. 8A

Fig. 8B

Fig. 8C

Fig. 8D

Fig. 8E

Fig. 8F

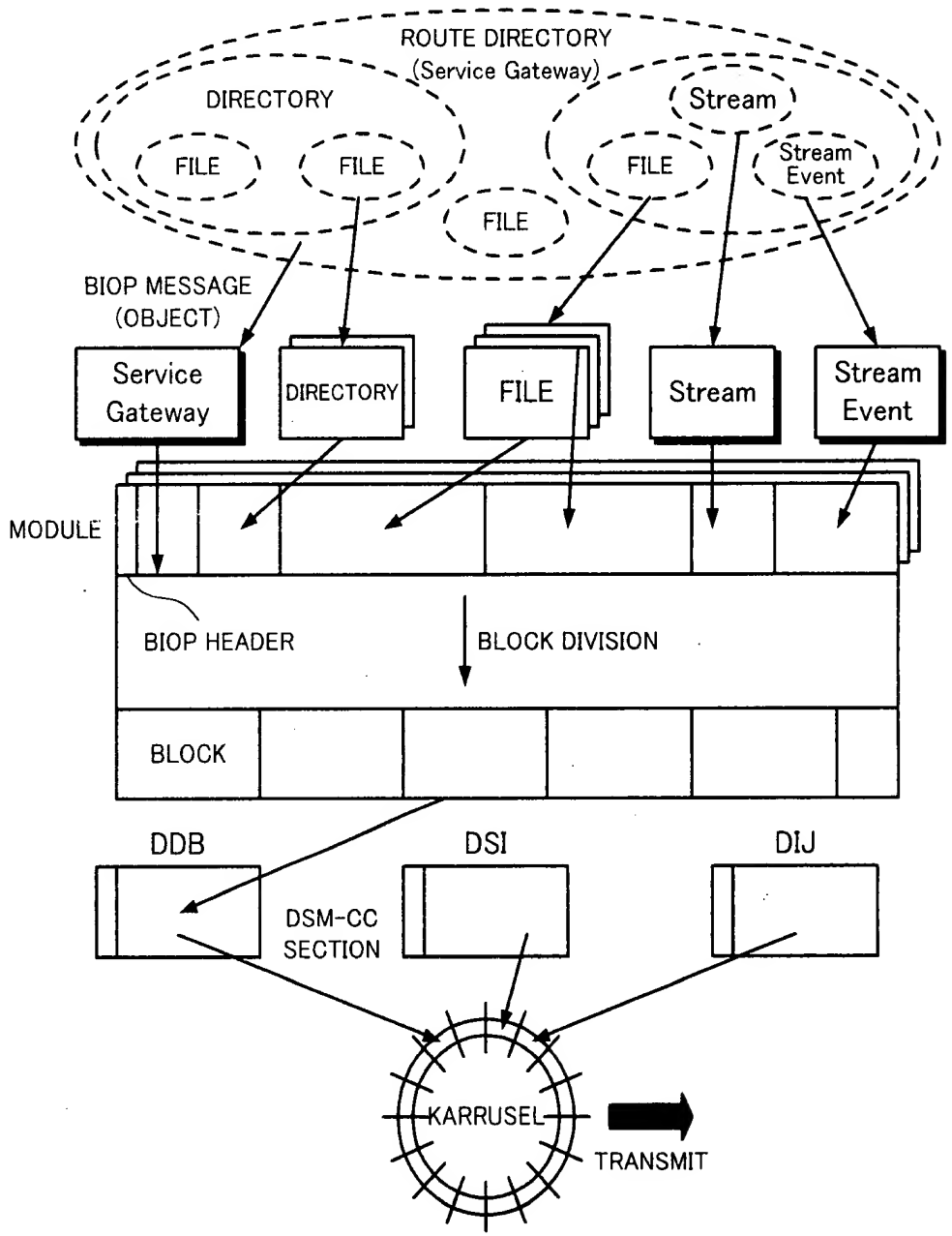


Fig. 9

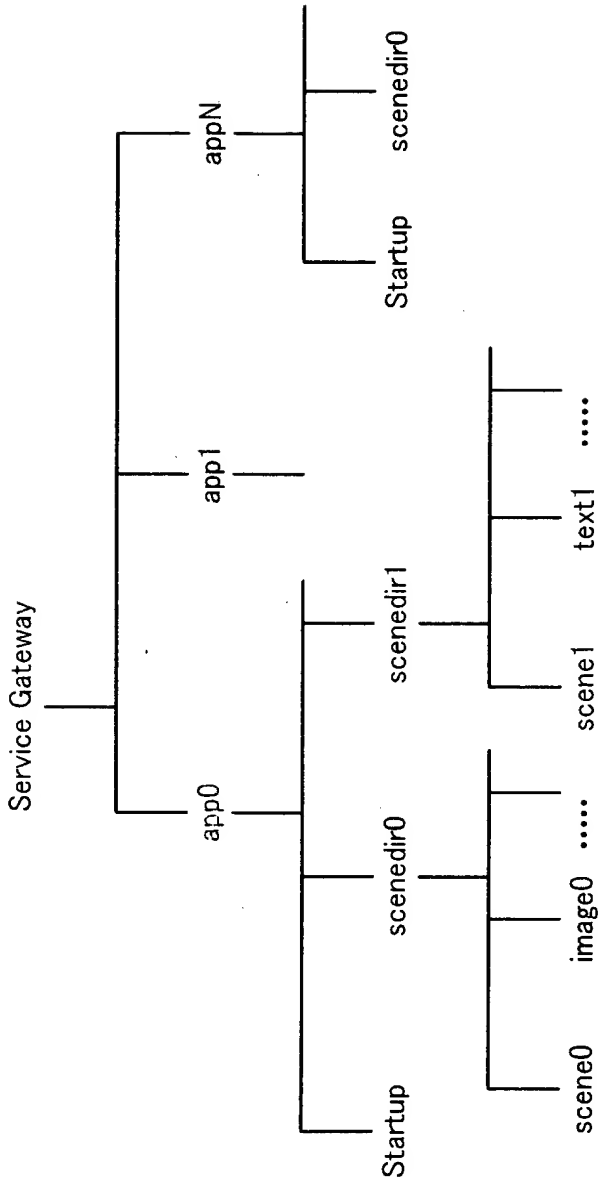

Service Gateway
app0
app1
appN
Startup
scenedir0
scenedir1
Startup
scenedir0
scene1
text1
.....
scene0
image0
.....

Fig. 10A

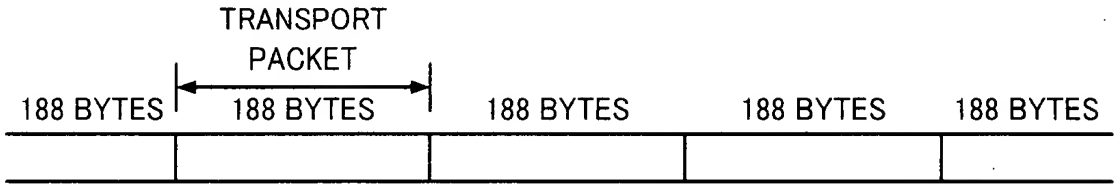


Fig. 10B

Fig. 10C

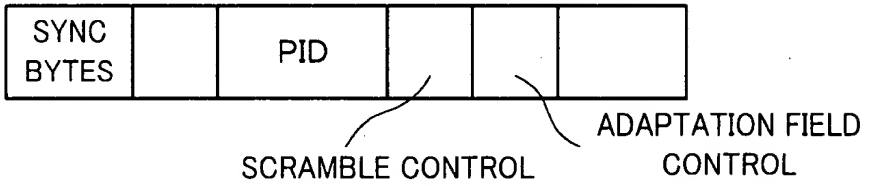


Fig. 11A

Fig. 11B

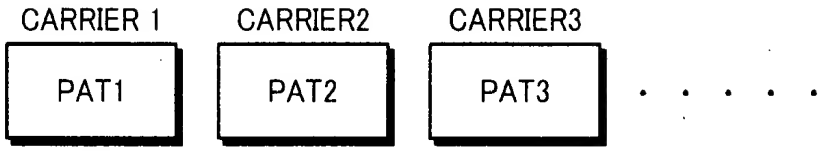


Fig. 11C

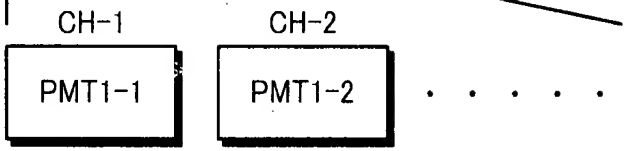


Fig. 11D

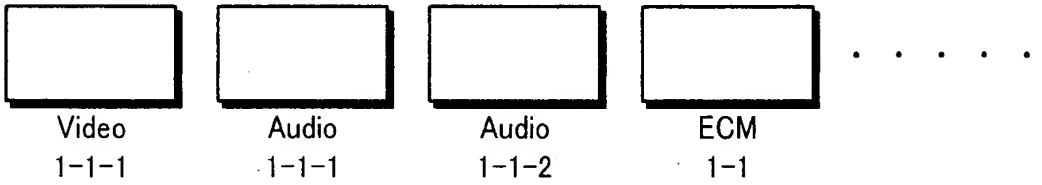


Fig. 12

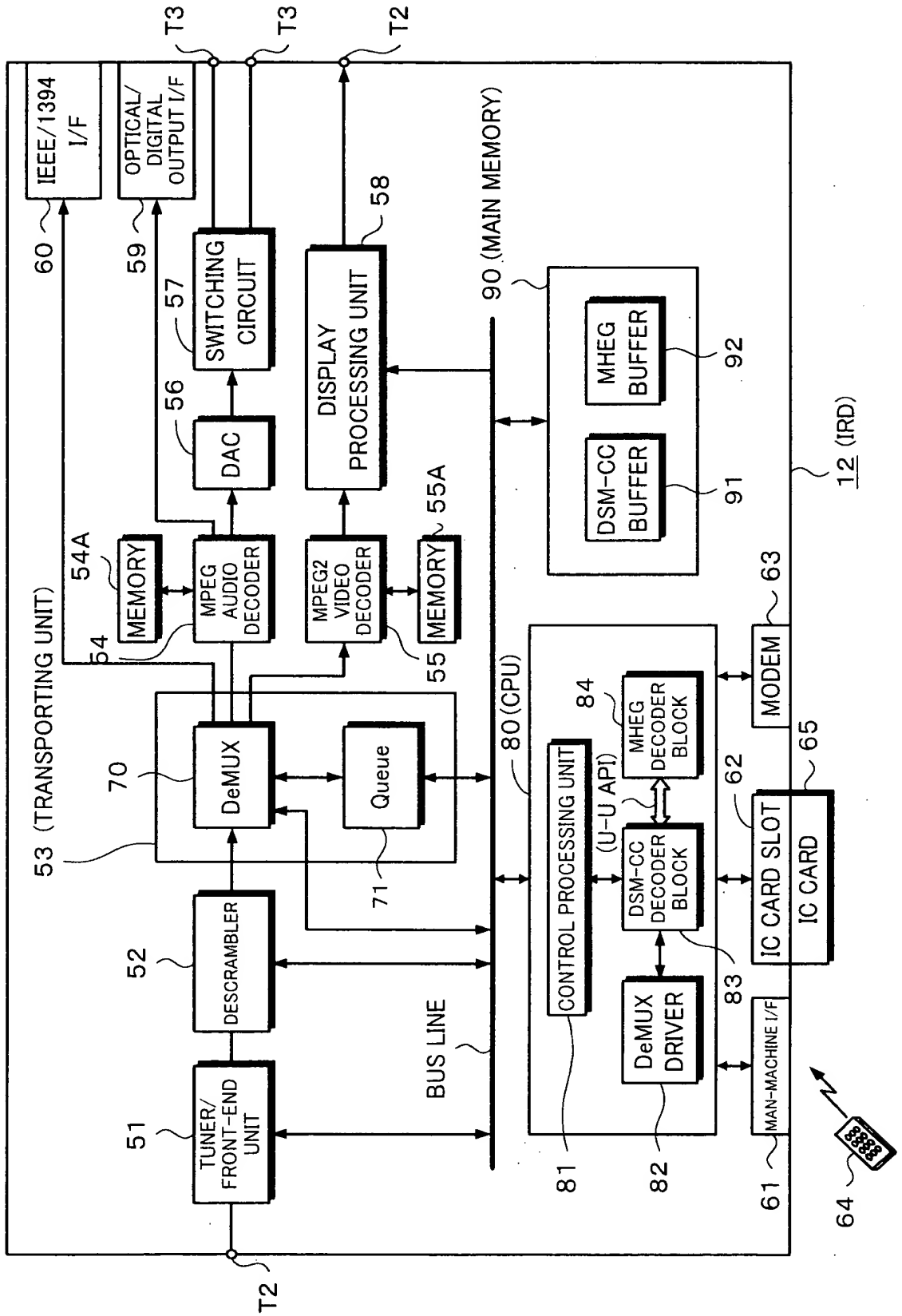

IEEE/1394 I/F
OPTICAL/ DIGITAL OUTPUT I/F
T3
T3
T2
60
59
57
SWITCHING CIRCUIT
58
DISPLAY PROCESSING UNIT
90 (MAIN MEMORY)
56
DAC
MHEG BUFFER
92
DSM-CC BUFFER
91
12 (IRD)
54A
MEMORY
MPEG AUDIO DECODER
MPEG2 VIDEO DECODER
MEMORY
55A
54
55
63
MODEM
53 (TRANSPORTING UNIT)
70
DeMUX
Queue
80 (CPU)
84
MHEG DECODER BLOCK
CONTROL PROCESSING UNIT
(U-U API)
62
65
DSM-CC DECODER BLOCK
IC CARD SLOT
IC CARD
71
52
DESCRAMBLER
BUS LINE
DeMUX DRIVER
83
MAN-MACHINE I/F
51
TUNER/ FRONT-END UNIT
81
82
61
64
T2

Fig. 13

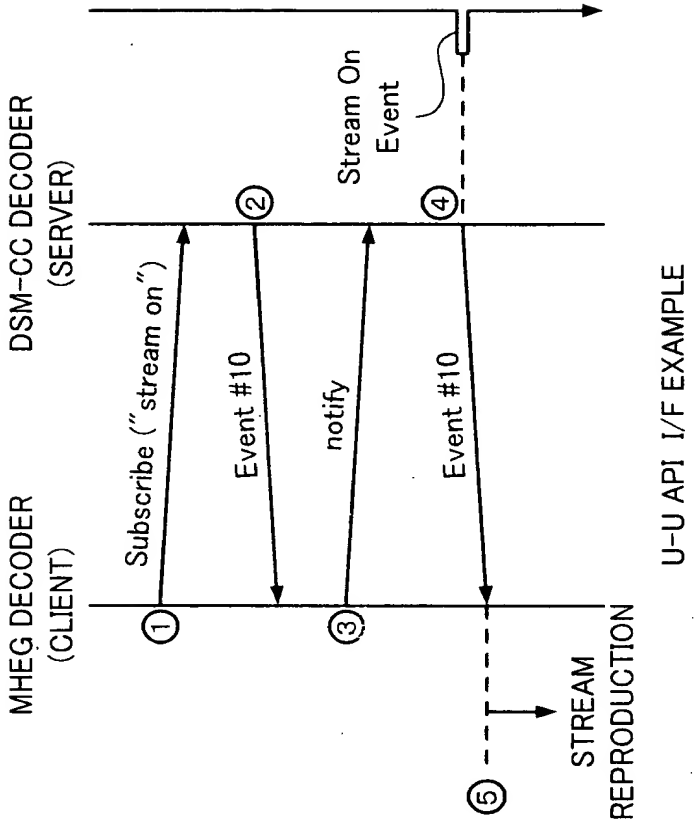

MHEG DECODER
(CLIENT)
DSM-CC DECODER
(SERVER)
Subscribe ("stream on")
Event #10
notify
Event #10
Stream On
Event
STREAM
REPRODUCTION
U-U API I/F EXAMPLE
①
②
③
④
⑤

Fig. 14

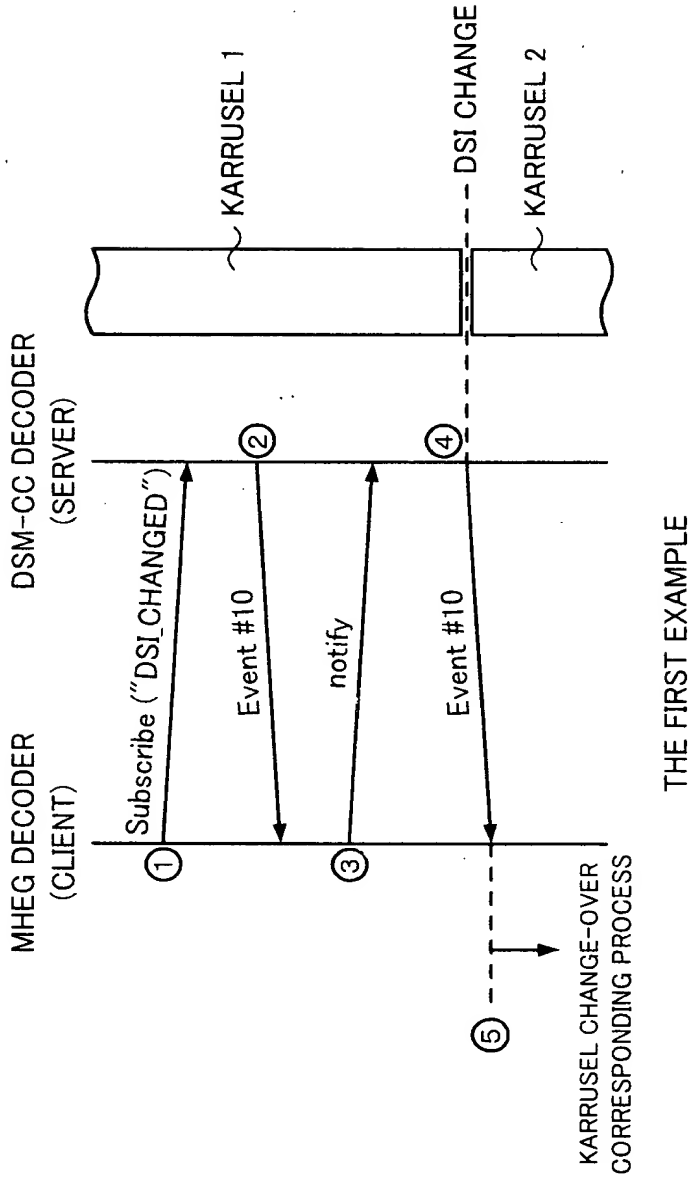

MHEG DECODER
(CLIENT)
DSM-CC DECODER
(SERVER)
KARRUSEL 1
DSI CHANGE
KARRUSEL 2
Subscribe ("DSI_CHANGED")
Event #10
notify
Event #10
①
②
③
④
⑤
KARRUSEL CHANGE-OVER
CORRESPONDING PROCESS
THE FIRST EXAMPLE

Fig. 15

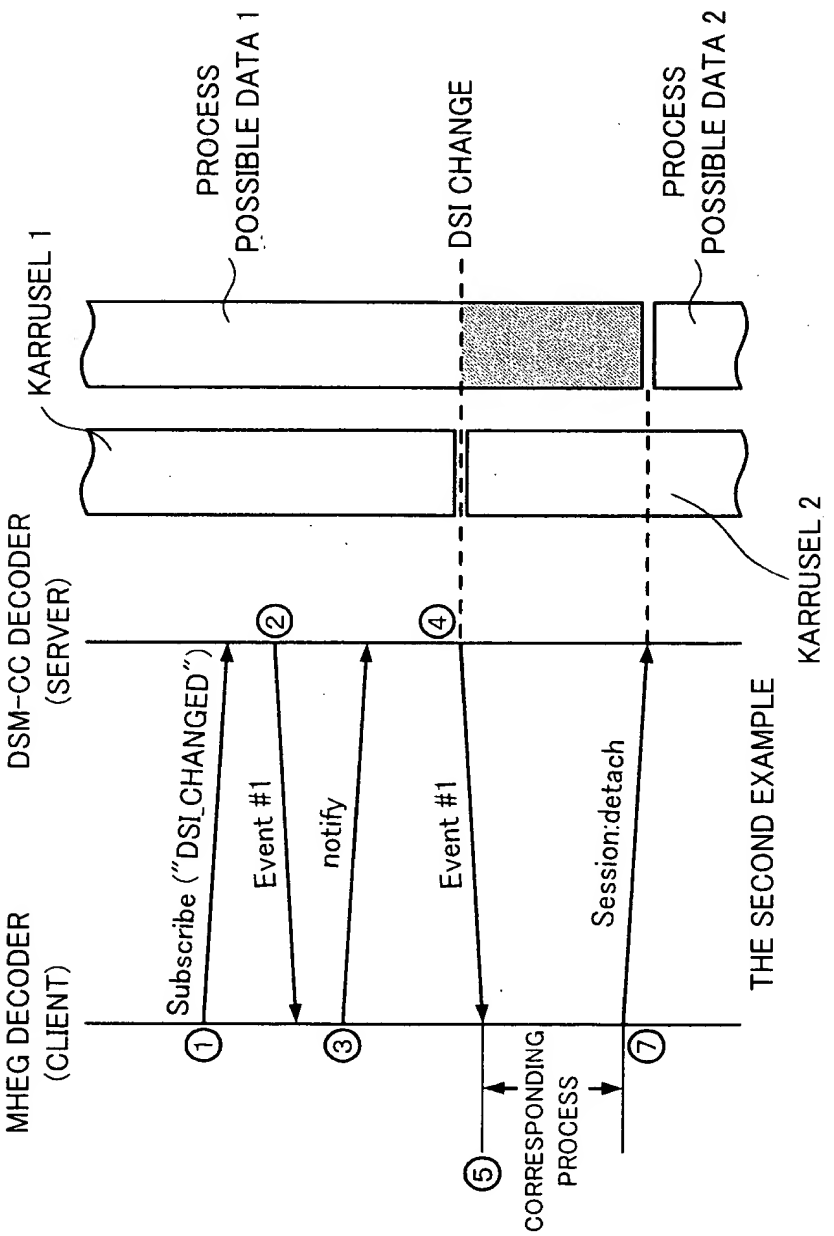
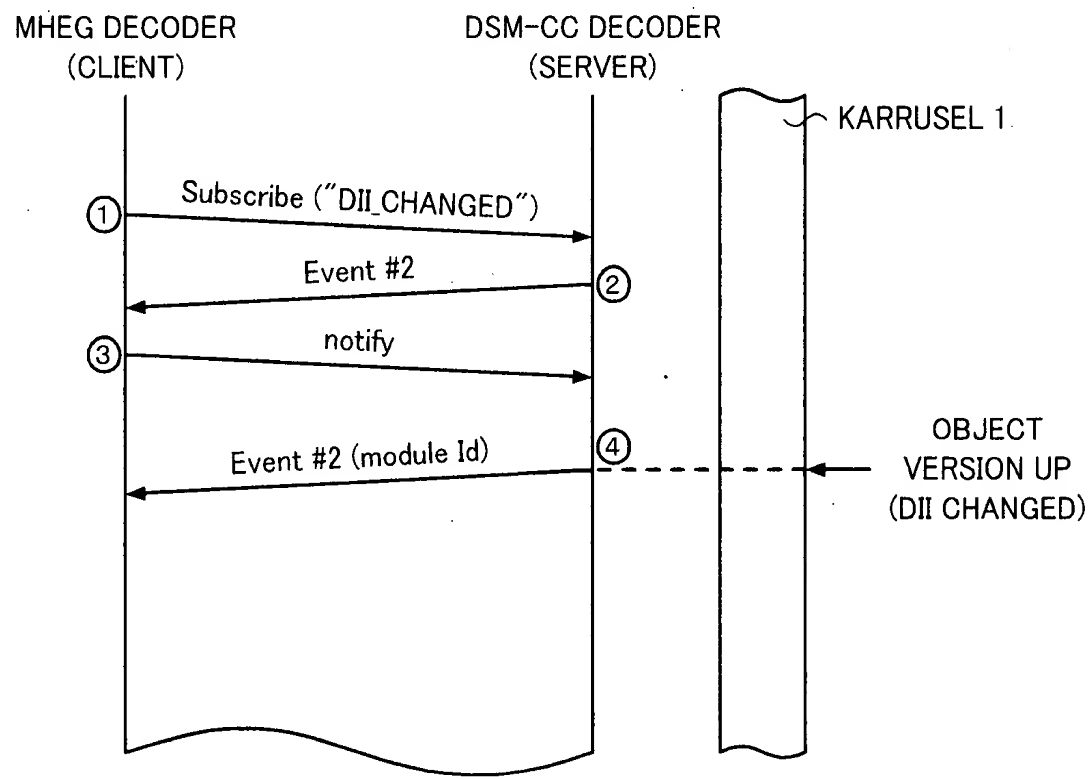
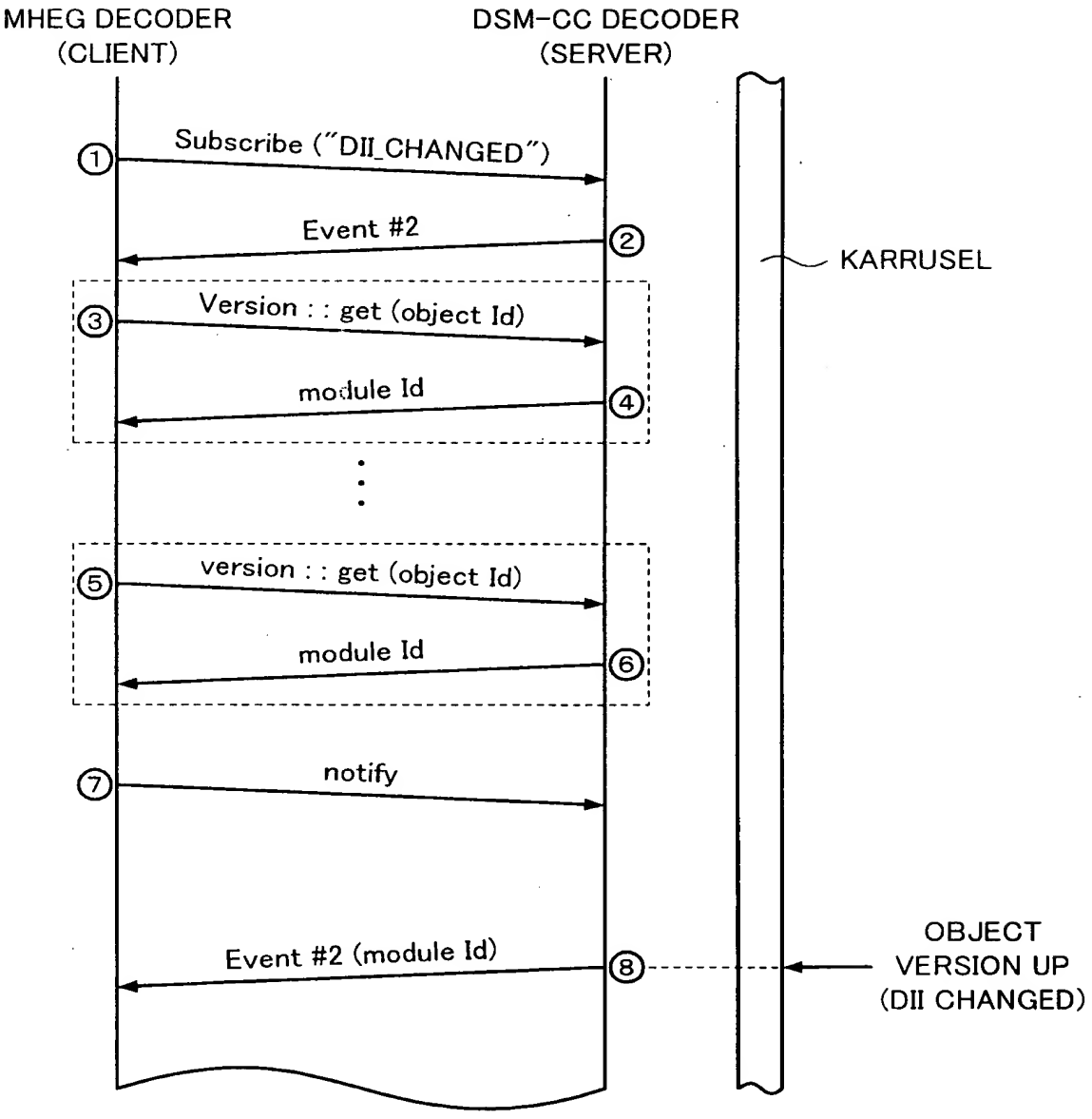

MHEG DECODER
(CLIENT)
DSM-CC DECODER
(SERVER)
KARRUSEL 1
KARRUSEL 2
PROCESS
POSSIBLE DATA 1
DSI CHANGE
PROCESS
POSSIBLE DATA 2
Subscribe ("DSI_CHANGED")
Event #1
notify
Event #1
Session:detach
CORRESPONDING
PROCESS
①
②
③
④
⑤
⑦
THE SECOND EXAMPLE

Fig. 16



THE FIRST EXAMPLE

Fig. 17

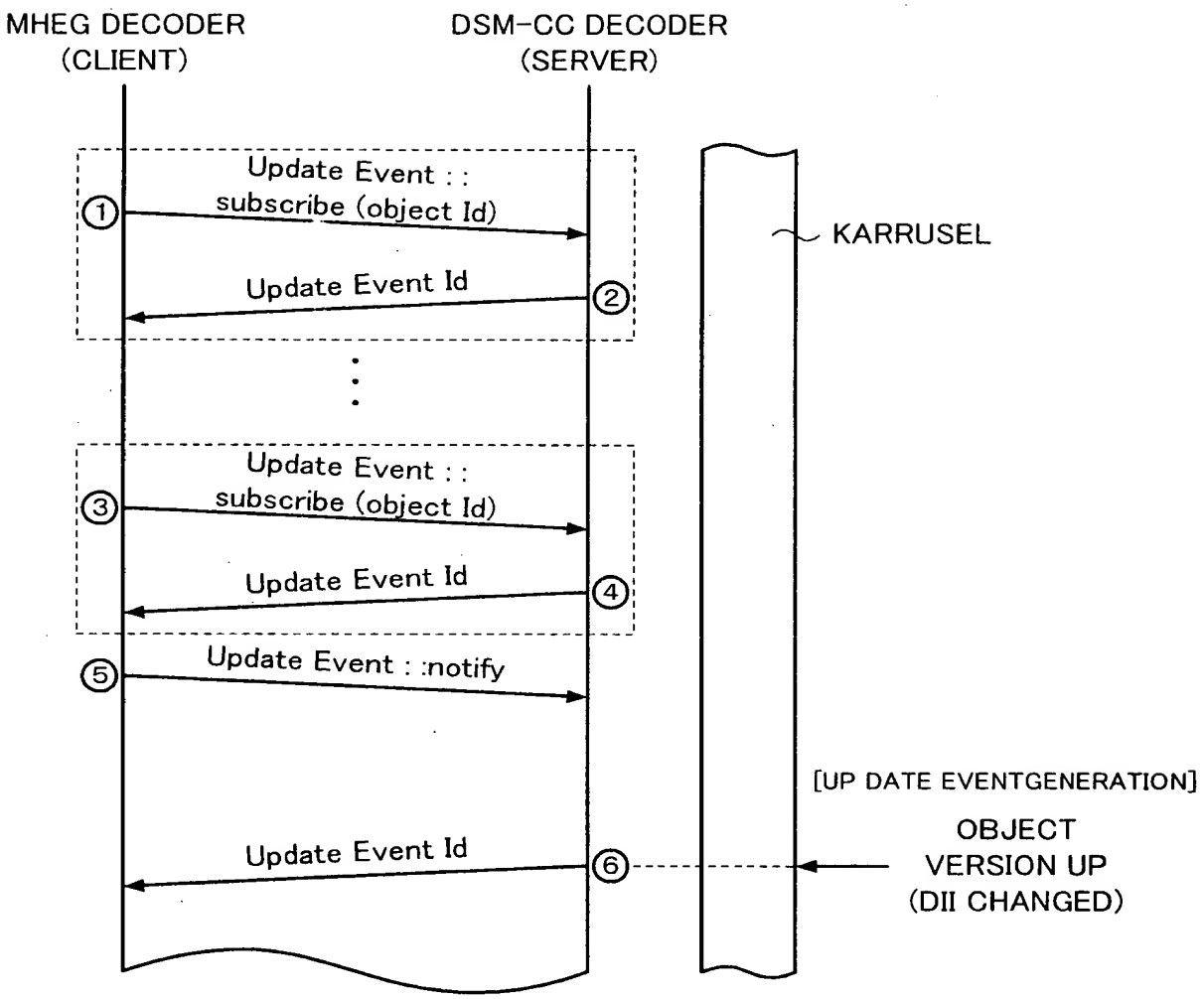


THE SECOND EXAMPLE

Fig. 18

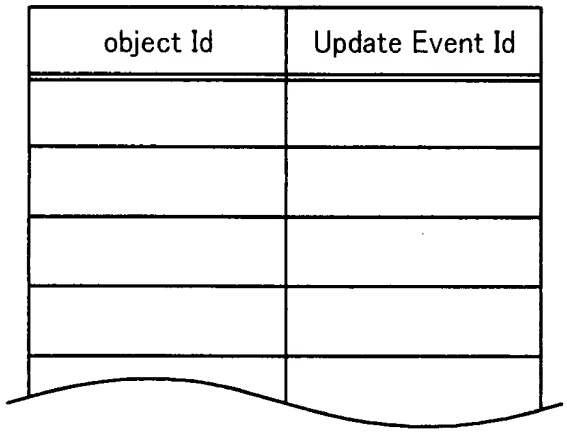
object Id	module Id

Fig. 19



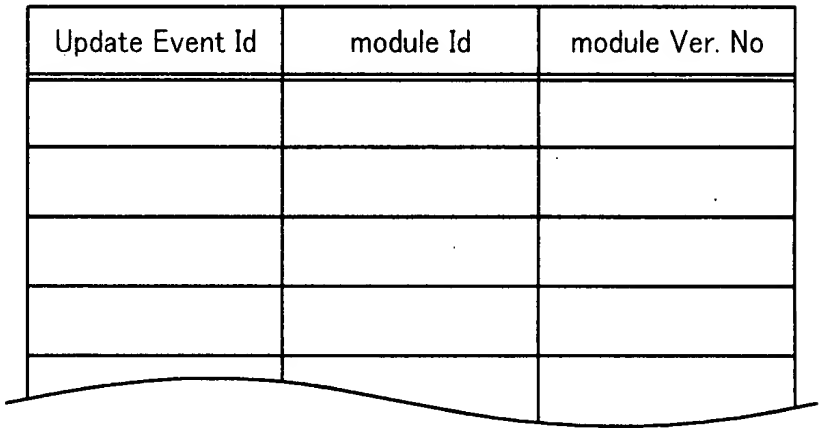
THE THIRD EXAMPLE

Fig. 20A



MHEG DECODER TABLE

Fig. 20B



DSM-CC DECODER TABLE

Fig. 21

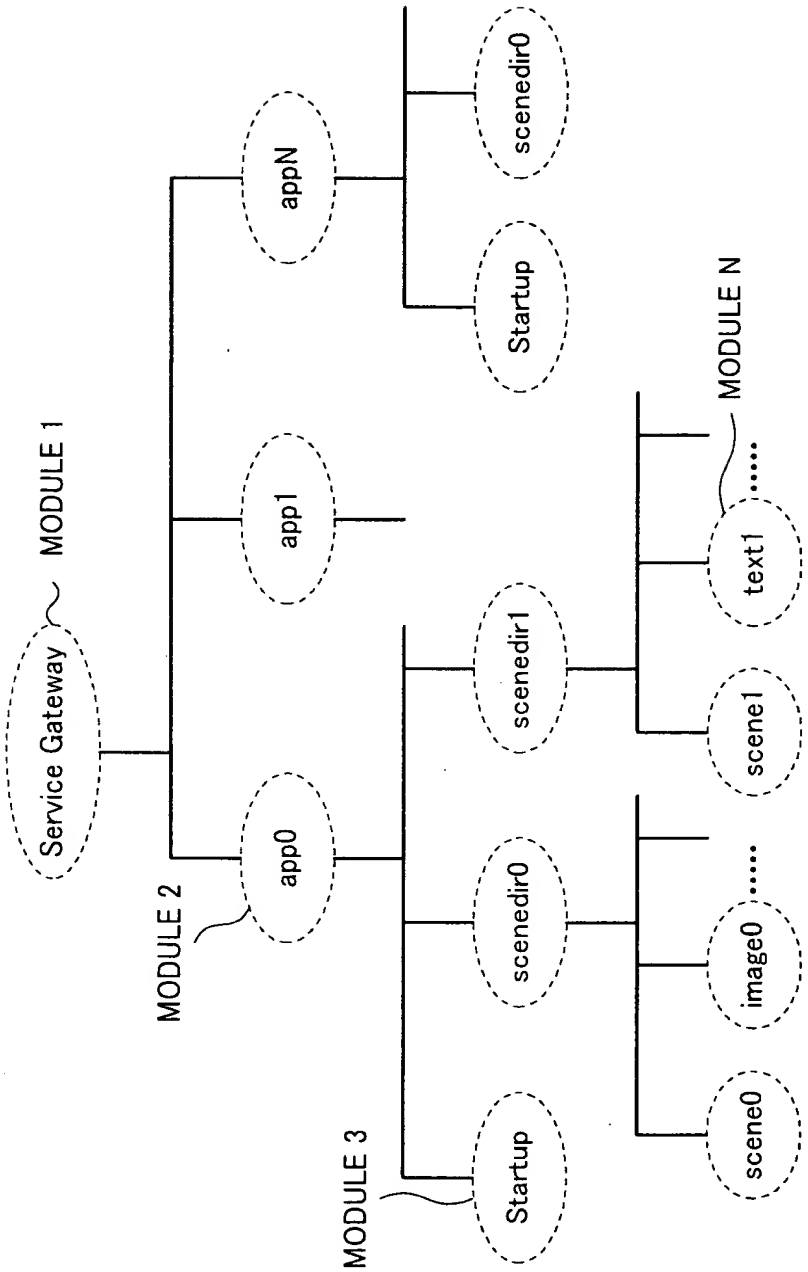

Service Gateway
MODULE 1
MODULE 2
MODULE 3
MODULE N
app0
app1
appN
Startup
scenedir0
scenedir1
Startup
scene0
image0
scene1
text1

Fig. 22

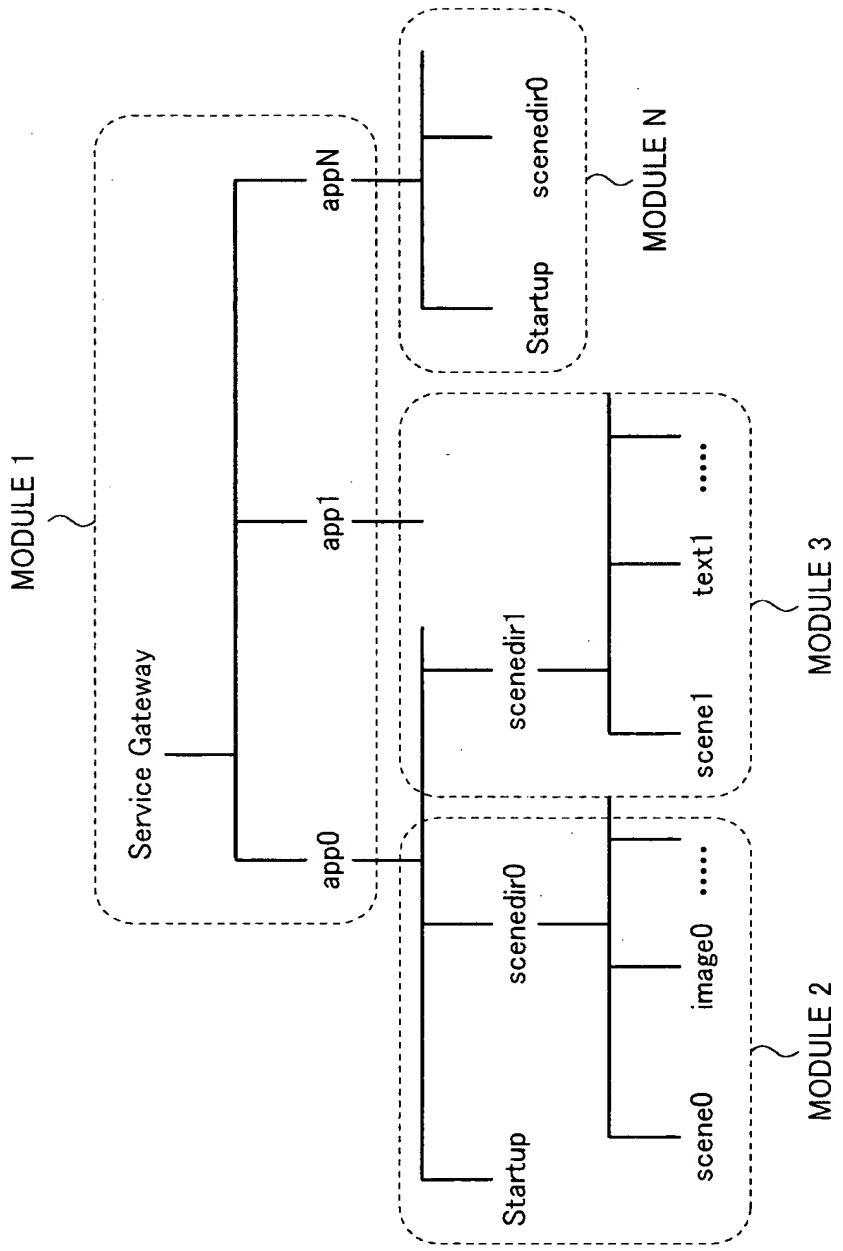

MODULE 1
Service Gateway
app0
app1
appN
MODULE 2
Startup
scenedir0
scene0
image0
.....
MODULE 3
scenedir1
scene1
text1
.....
MODULE N
Startup
scenedir0

Fig. 23

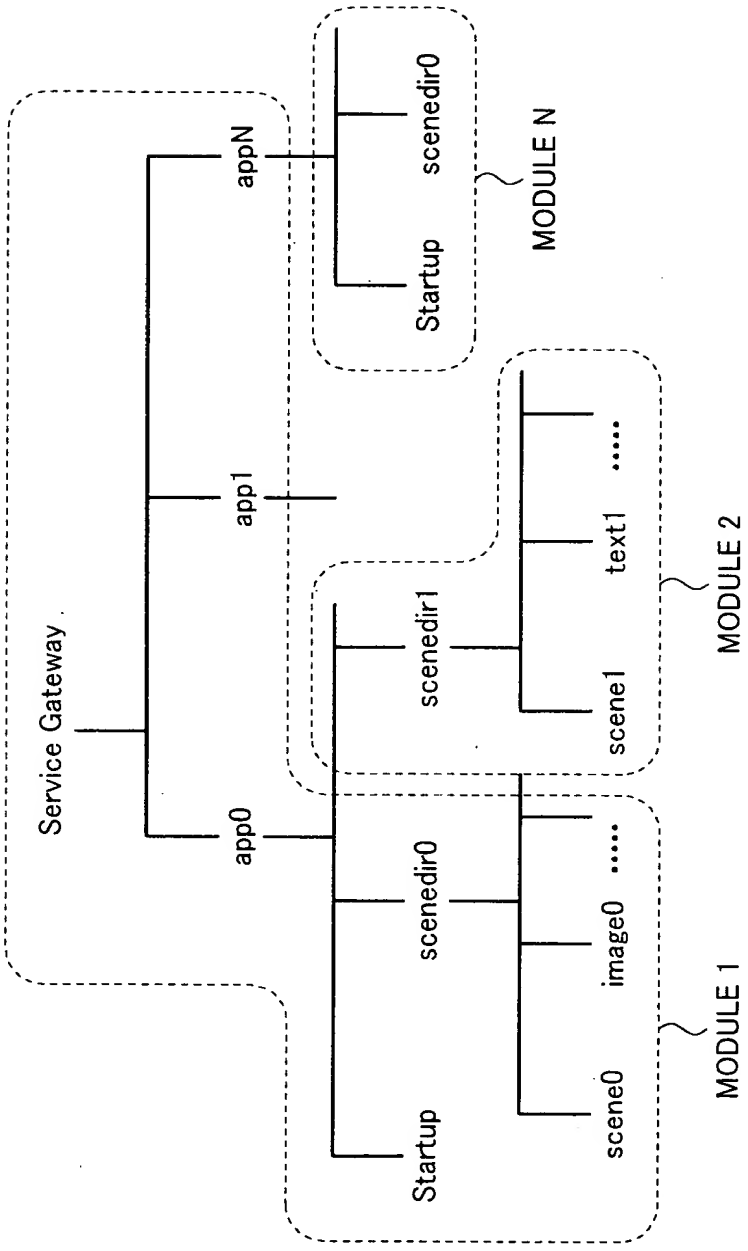

Service Gateway
app0
app1
appN
Startup
scenedir0
scene0
image0
.....
scenedir1
scene1
text1
.....
Startup
scenedir0
MODULE 1
MODULE 2
MODULE N

Fig. 24A

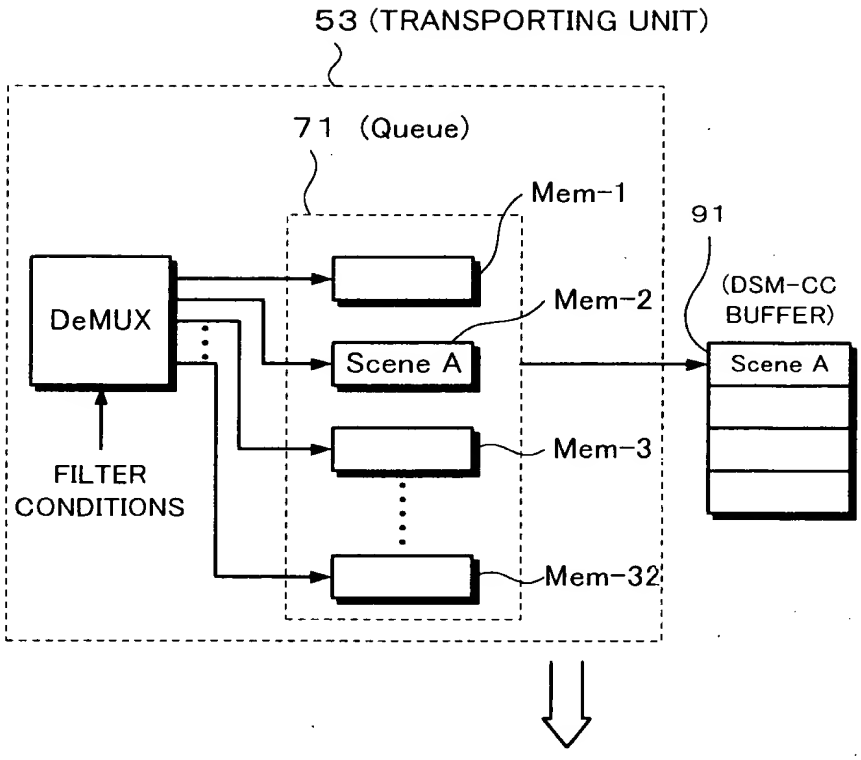


Fig. 24B

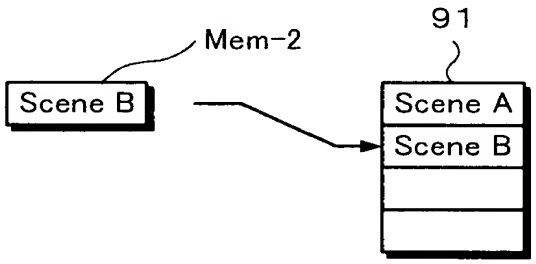


Fig. 24C

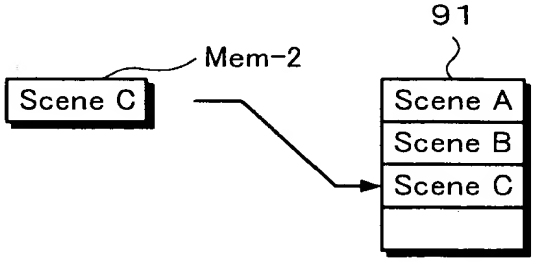
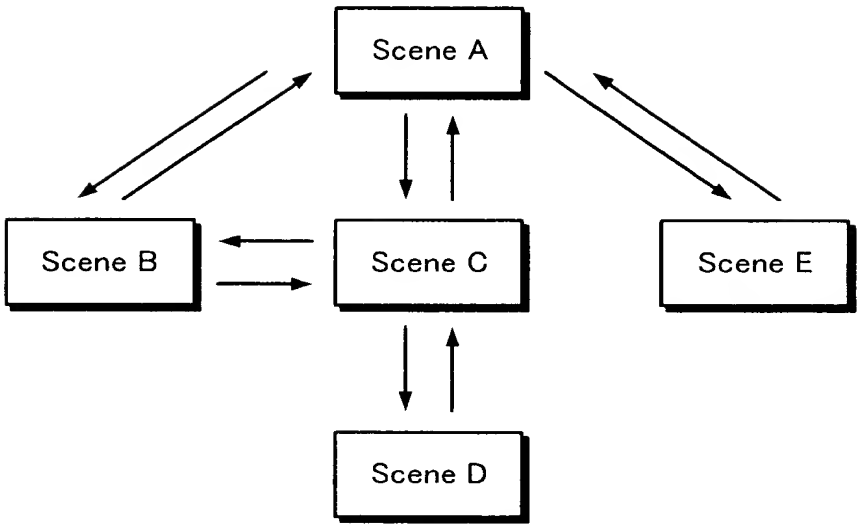
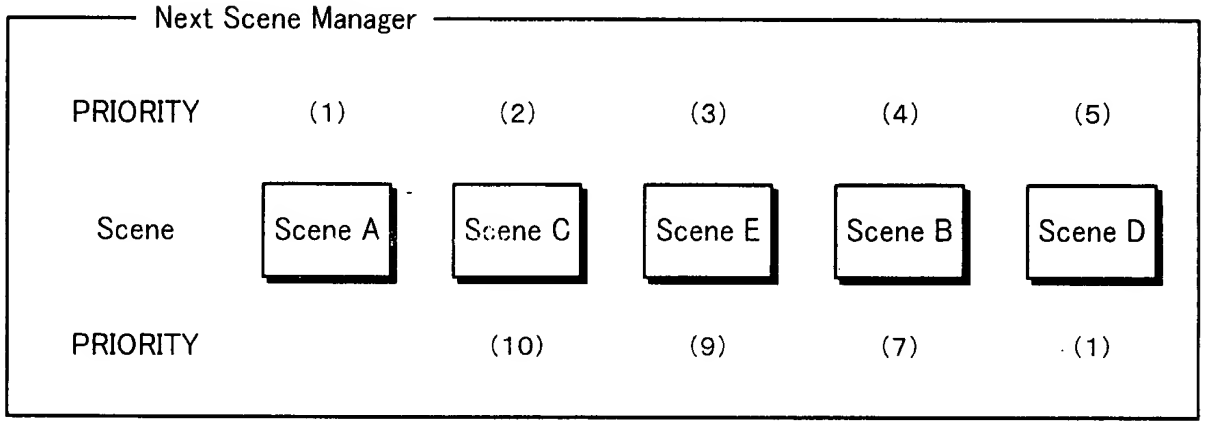


Fig. 25



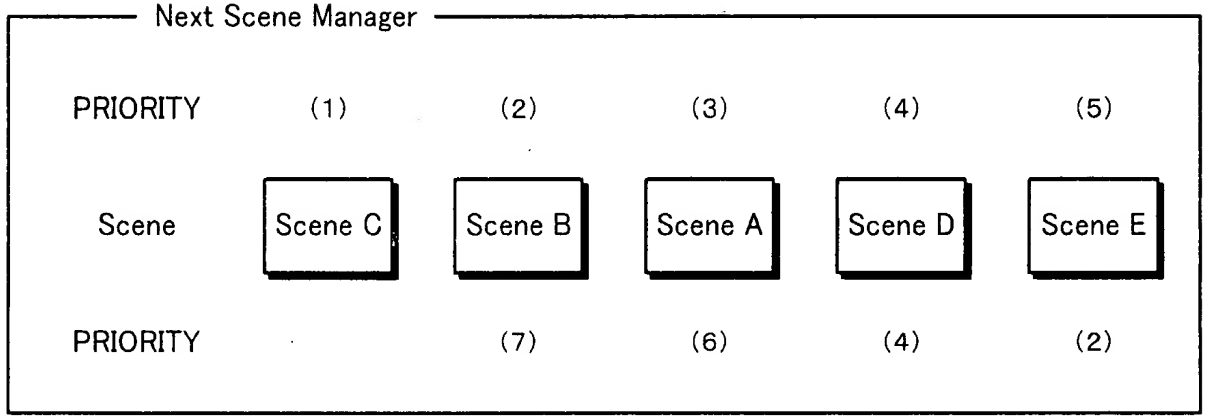
TRANSITION EXAMPLE

Fig. 26



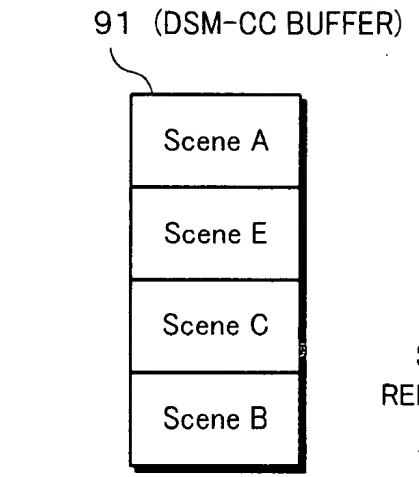
WHEN SCENE A IS OUTPUTTED

Fig. 27



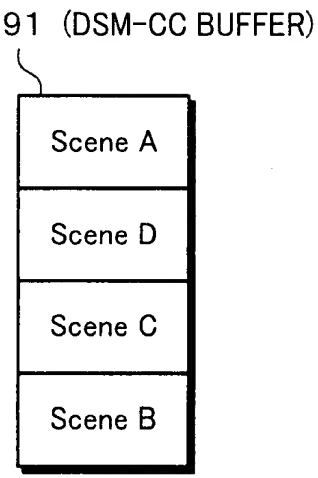
WHEN SCENE C IS OUTPUTTED

Fig. 28A



WHEN SCENE A IS OUTPUTTED

Fig. 28B



SCENE E IS REPLACED WITH SCENE D

WHEN SCENE C IS OUTPUTTED

Fig. 29A

Fig. 29
Fig. 29A
Fig. 29B

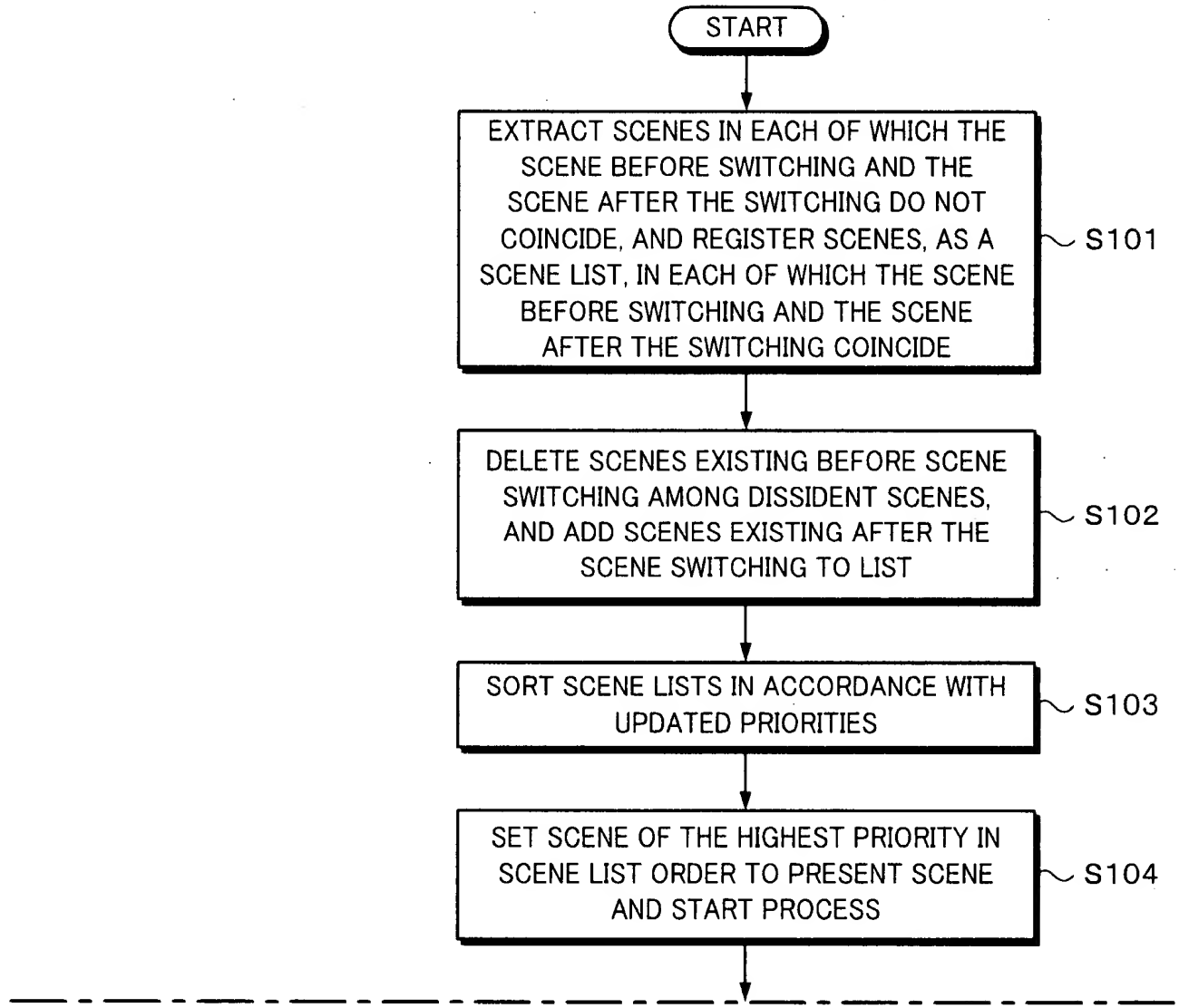


Fig. 29B

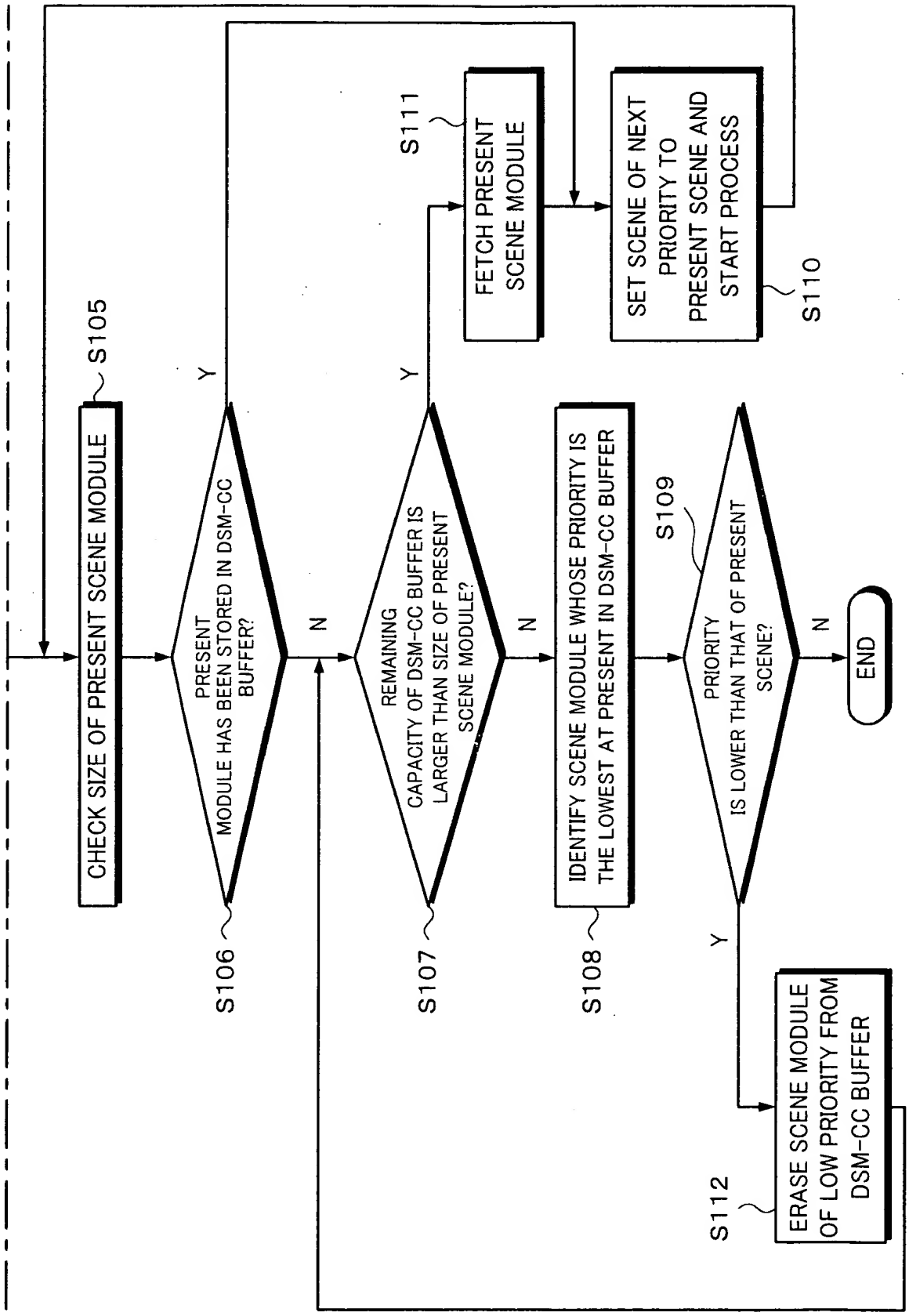

CHECK SIZE OF PRESENT SCENE MODULE
S105
PRESENT MODULE HAS BEEN STORED IN DSM-CC BUFFER?
S106
Y
N
REMAINING CAPACITY OF DSM-CC BUFFER IS LARGER THAN SIZE OF PRESENT SCENE MODULE?
S107
Y
N
IDENTIFY SCENE MODULE WHOSE PRIORITY IS THE LOWEST AT PRESENT IN DSM-CC BUFFER
S108
PRIORITY IS LOWER THAN THAT OF PRESENT SCENE?
S109
Y
N
END
ERASE SCENE MODULE OF LOW PRIORITY FROM DSM-CC BUFFER
S112
FETCH PRESENT SCENE MODULE
S111
SET SCENE OF NEXT PRIORITY TO PRESENT SCENE AND START PROCESS
S110

Fig. 30A

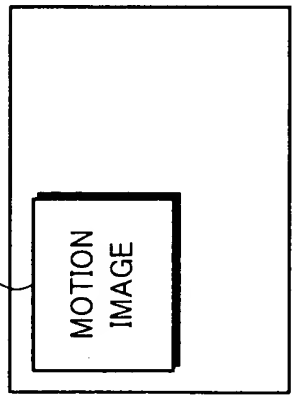


Fig. 30B

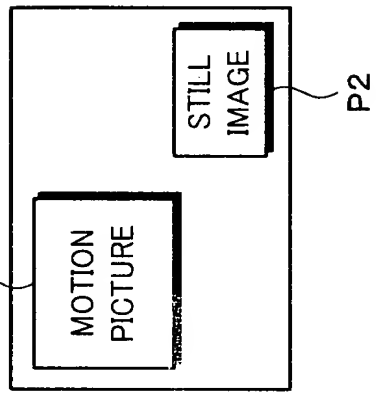


Fig. 30C

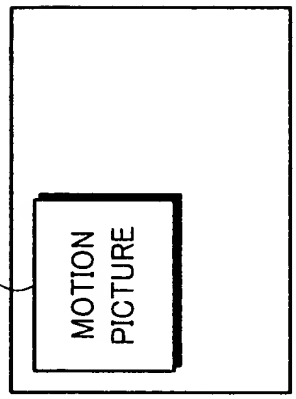


Fig. 31

DISPLAY DATA DESCRIPTION

INITIAL STATE:MOTION IMAGE DISPLAY ON
INITIAL STATE:STILL IMAGE A DISPLAY OFF
MOTION IMAGE:COORDINATES (10,10)
SIZE (300,225)
STILL IMAGE:COORDINATES (450,250)
SIZE (200,150)
.....
IF EVENT 1 IS GENERATEED, STILL IMAGE DISPLAY ON
.....
.....
IF EVENT 2 IS GENERATED, STILL IMAGE DISPLAY OFF
.....

DISPLAY MADIA DATA
STILL IMAGE A

Fig. 32

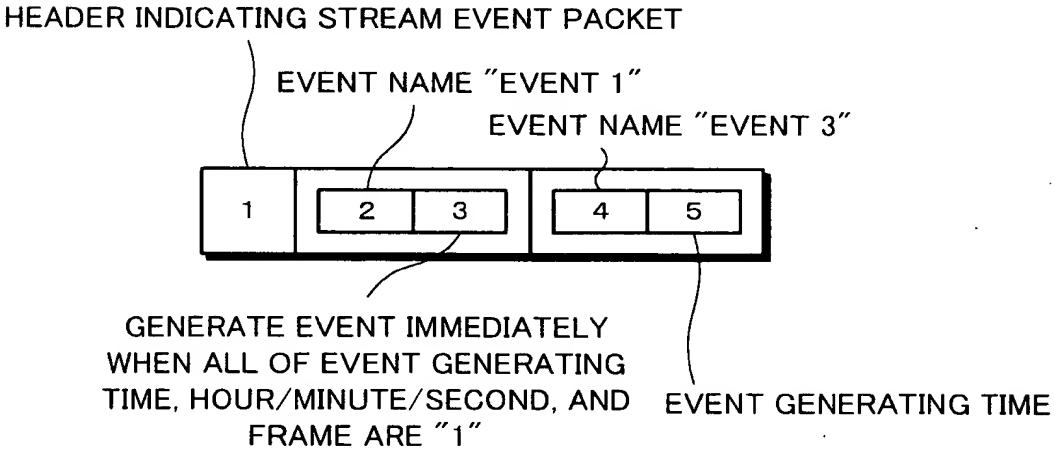


Fig. 33A

Fig. 33B

Fig. 33C

Fig. 33D

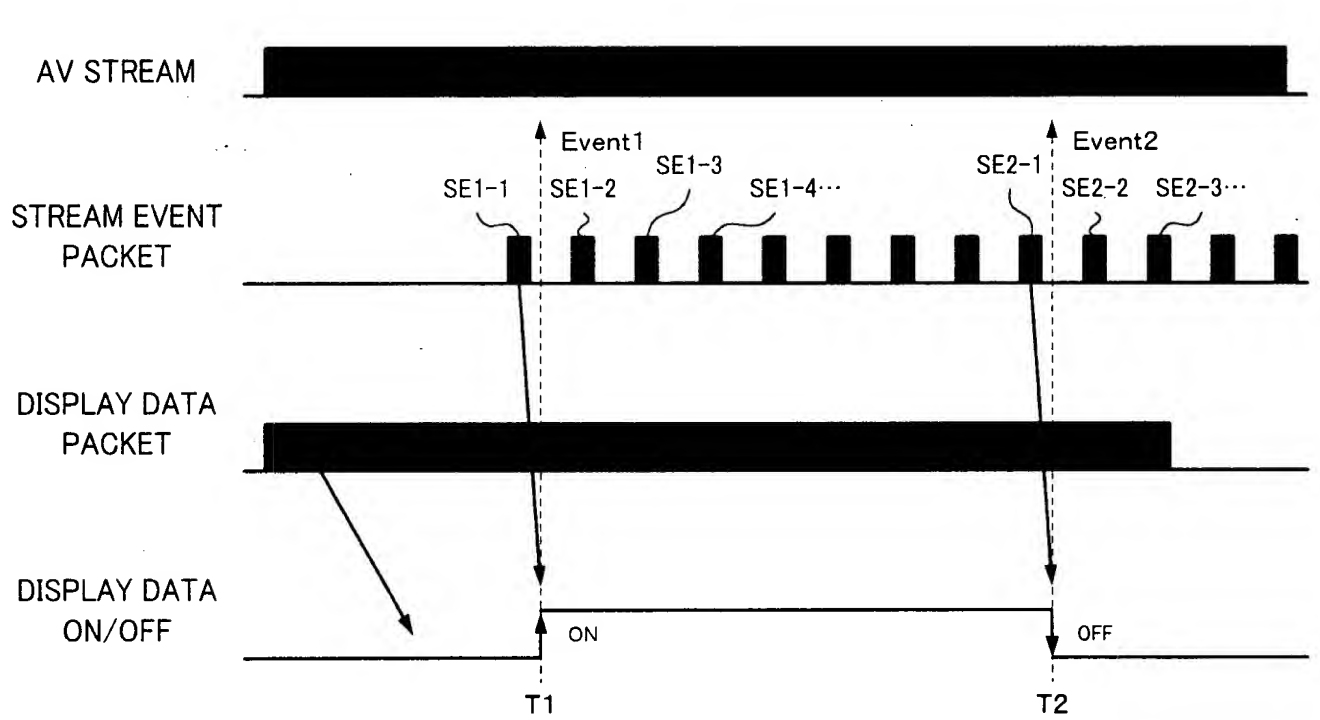


Fig. 34A

Fig. 34B

Fig. 34C

Fig. 34D

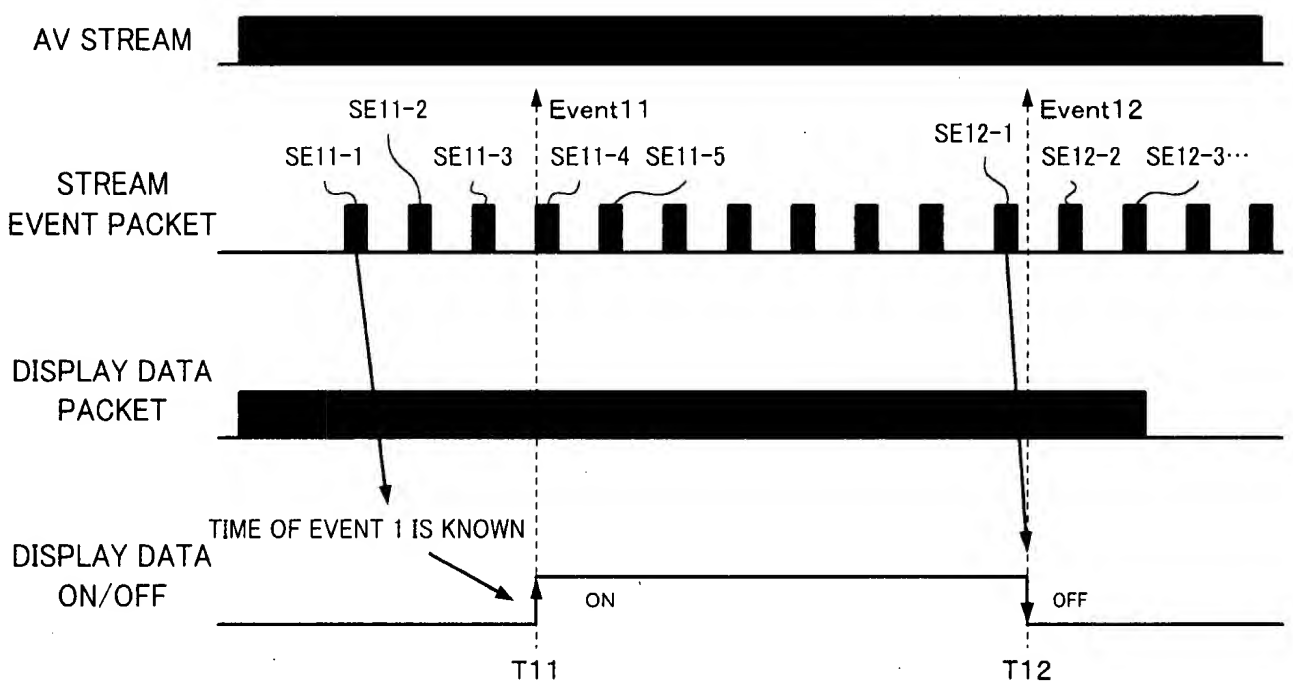


Fig. 35A

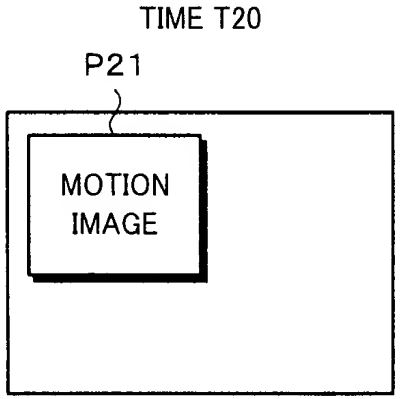


Fig. 35B

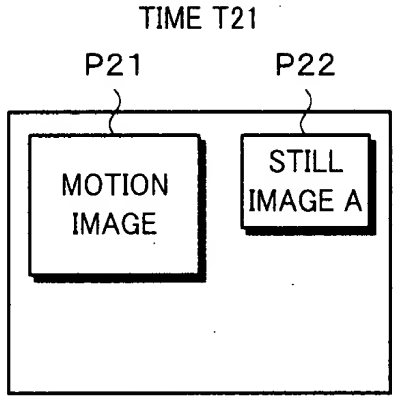


Fig. 35C

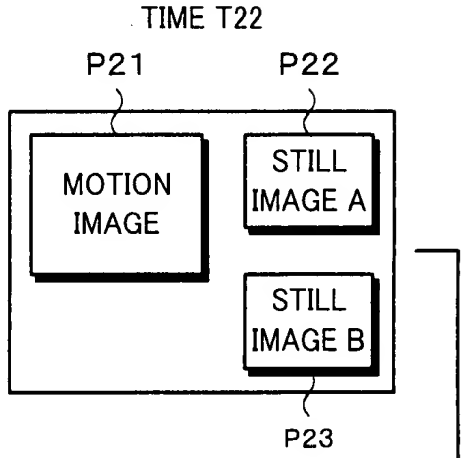


Fig. 35D

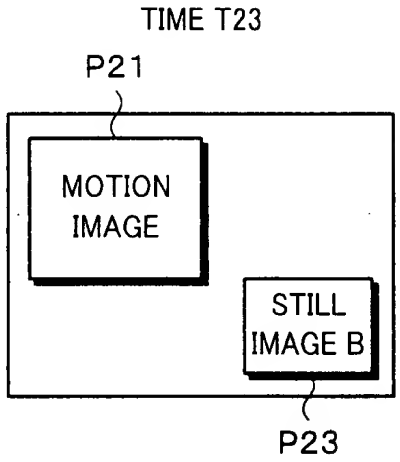


Fig. 35E

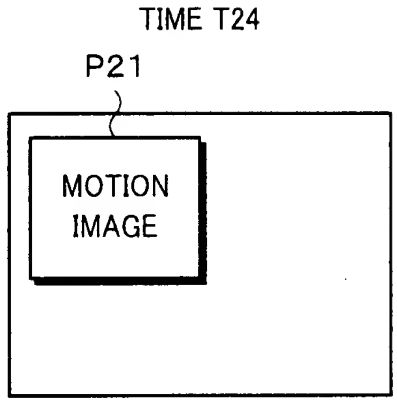


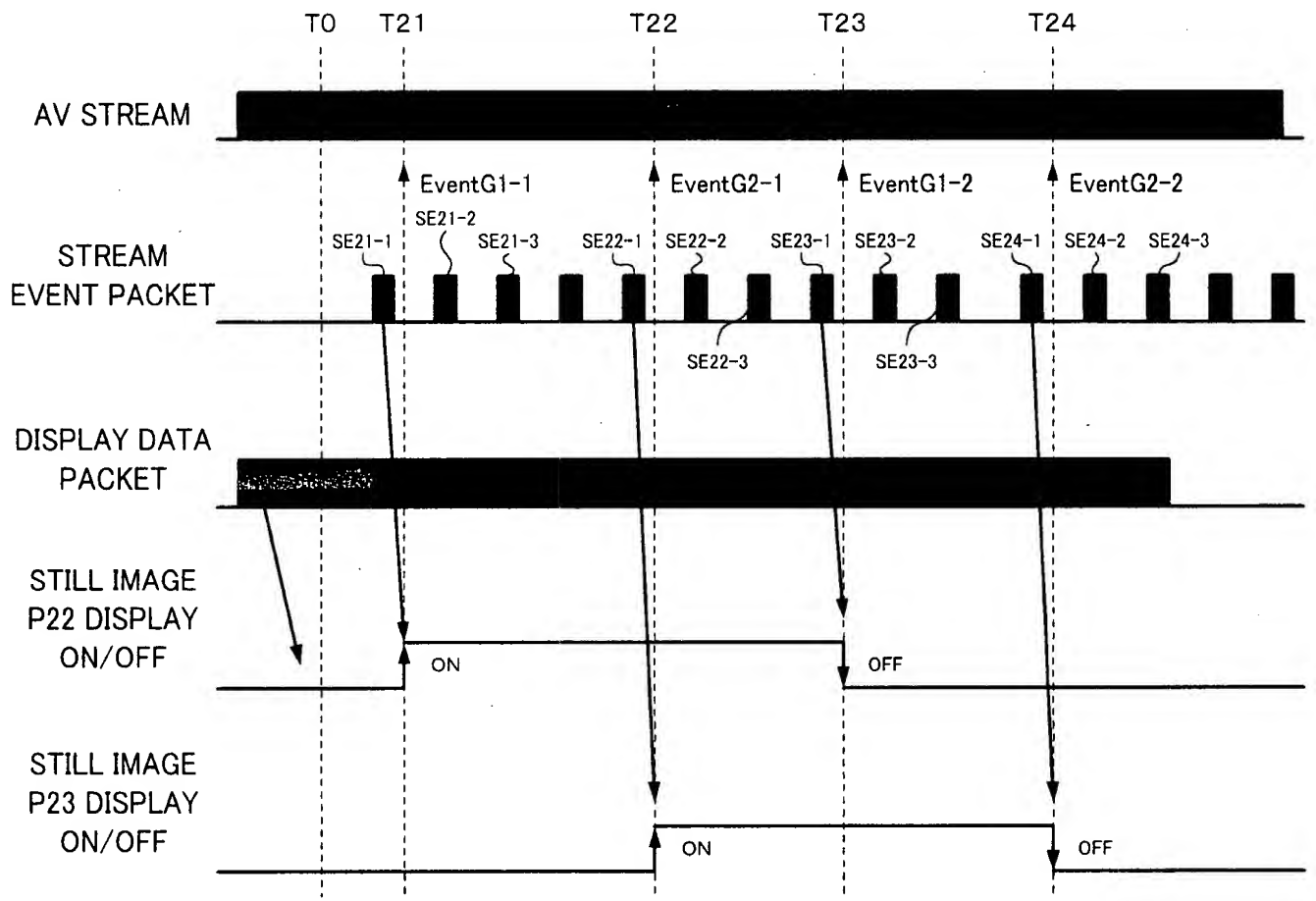
Fig. 36A

Fig. 36B

Fig. 36C

Fig. 36D

Fig. 36E



1.. GROUND STATION
2.. SATELLITE
3.. RECEIVING FACILITIES
38.. GUI SOURCE DATABASE
42.. GUI AUTHORING SYSTEM
44.. DSM-CC ENCODER
45.. MULTIPLEXER